Calculation of prompt neutron multiplicities and spectra for several actinides

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The prompt fission neutron multiplicity and spectra of actinides are nuclear data of crucial importance. Based on experimental fission yield and total kinetic energy data, new calculations for the prompt neutron multiplicity and spectra for ^{235,238}U(n,f), ^{237}Np(n,f) in the incident neutron energy range up to 20 MeV and for ^{252}Cf(SF) have been performed.

For the first time the multi-modality of the fission process was taken into account. Additionally, for some isotopes a more realistic fission fragment residual temperature distribution as well as an anisotropy of the prompt neutron emission led to improved agreement between the calculation and experimental results. Also the range of fission fragment pairs entering in the multiplicity and spectrum model was extended over the entire experimental fission fragment mass range. This led to an improved version of the Los Alamos model and especially to an improved determination of the input model parameters.

The results of the calculations will be presented.

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